# A Descriptive Observational Study of Effect of Covid-19 Pandemic on Routine Immunization in Children at Tertiary Health Care Centre

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**Abstract:** Background: Immunization has crucial role in protecting a child from vaccine preventable infections. But during last year 2020, Due to COVID-19 pandemic, Routine& supplementary immunization and the surveillance of vaccine-preventable diseases have been impacted in many countries. This may lead to the resurgence of vaccine-preventable diseases. So, we have opted this study to see impact of Covid 19 on routine immunization at vaccination centre of a tertiary care hospital. Aims: To assess effect of covid 19 pandemic on routine immunization. Material And Methods: This study was retrospective observational study, conducted at vaccination centre of tertiary care hospital of Ahmedabad. Data was retrieved from January 2019 to December 2020 from register of vaccination centre and entered in excel sheet and analysed individual month and vaccine wise. Result: Number of immunised children was lower in 2020 as compared to 2019. The result was significant at $p<0.05$ by Mann Whity test. Inj Td of 10 year was most affected and OPV0 & BCG was least affected. Maximum reduction in percentage was seen in May month and least in February. Conclusion: Health system should design strategies for catch-up vaccination to prevent surge of vaccine preventable disease. [Prajapati V Natl J Integr Res Med, 2021; 12(4):45-50]

**Key Words:** Covid-19 Pandemic, vaccine preventable disease. Catch up vaccination

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**Introduction:** Immunization has crucial role in protecting a child from a many dangerous vaccine preventable infections. But during the year 2020, the novel coronavirus disease COVID-19 pandemic has drawn worldwide attention. All countries and areas have initiated measures to prevent transmission and reduce the impact of covid-19 the outbreak on health-care systems, including shifting the health-care resources as a response to COVID-19[1].

The COVID-19 pandemic is posing an unprecedented challenge to health systems globally, with serious implications for immunization services. Routine immunizations, supplementary immunization activities and the surveillance of vaccine-preventable diseases are being impacted in many countries due to the pandemic. The decline in routine immunizations and an impaired surveillance system may well lead to the resurgence of vaccine-preventable diseases. Lock down and fear of visiting health care centres had also adversely affected routine immunization[2]. In late March 2020, concerned that mass gatherings for vaccination campaigns would enflame transmission of COVID-19, WHO recommended countries to temporarily suspend preventive campaigns while assessments of risk, and effective measures for reducing COVID virus transmission were established [3].

WHO has since monitored the situation and on 20 may 2020, issued advice to help countries determine how and when to resume mass vaccination campaigns. WHO stated that At Least 80 Million Children under One at Risk of Diseases Such as Diphtheria, Measles and Polio as COVID-19 Disrupts Routine Vaccination efforts[3,4].

Several studies[6–11] have shown how health emergencies have distorted existing health systems and health-seeking behaviours, precipitating secondary disease outbreaks[5]. During the Ebola epidemic in West Africa, a secondary measles outbreak has occurred[6].

During the Ebola outbreak in Sierra Leone, health services were severely affected, and factors such as patients' fear of Ebola and death of healthcare staff has reportedly affected health-seeking behaviours and adversely impacted health service functioning[7].

There was exacerbation of mortality due to malaria, Human Immunodeficiency Virus HIV or Acquired Immunodeficiency Syndrome AIDS, and Tuberculosis as a result of the Ebola epidemic in several African countries[8].

The Severe Acute Respiratory Syndrome SARS outbreak also demonstrated how people changed their traveling behaviour, with over 70% of respondents avoiding visiting hospitals or mainland China to avoid contracting SARS[9]. With COVID-19 pandemic, there is concern for resurgence of vaccine preventable diseases like in post Ebola era [10,11]. So, UNICEF and WHO are calling for a need to maintain routine immunization activities where possible[12]. So, we have opted this study to see impact of Covid 19 on routine immunization at vaccination centre of a tertiary care hospital.

AIMS: This study was aimed to assess effect of covid 19 pandemic on routine immunization.

**Material & Methods:** This study was conducted at vaccination centre of tertiary care hospital of Ahmedabad city in Jan 2021. This was retrospective observational study. Data regarding distribution of different vaccines from January 2019 to December 2020 from immunization centre of tertiary centre was retrieved from register of vaccination centre. Data was entered in excel sheet and analysed.

**Results:** In table no-1, we calculated difference in percentage between no. of vaccination in 2019 and 2020, month wise and individual vaccine wise.

**Table: 1 Percentage Of Difference In Vaccination As Compare To 2019 Vaccination**

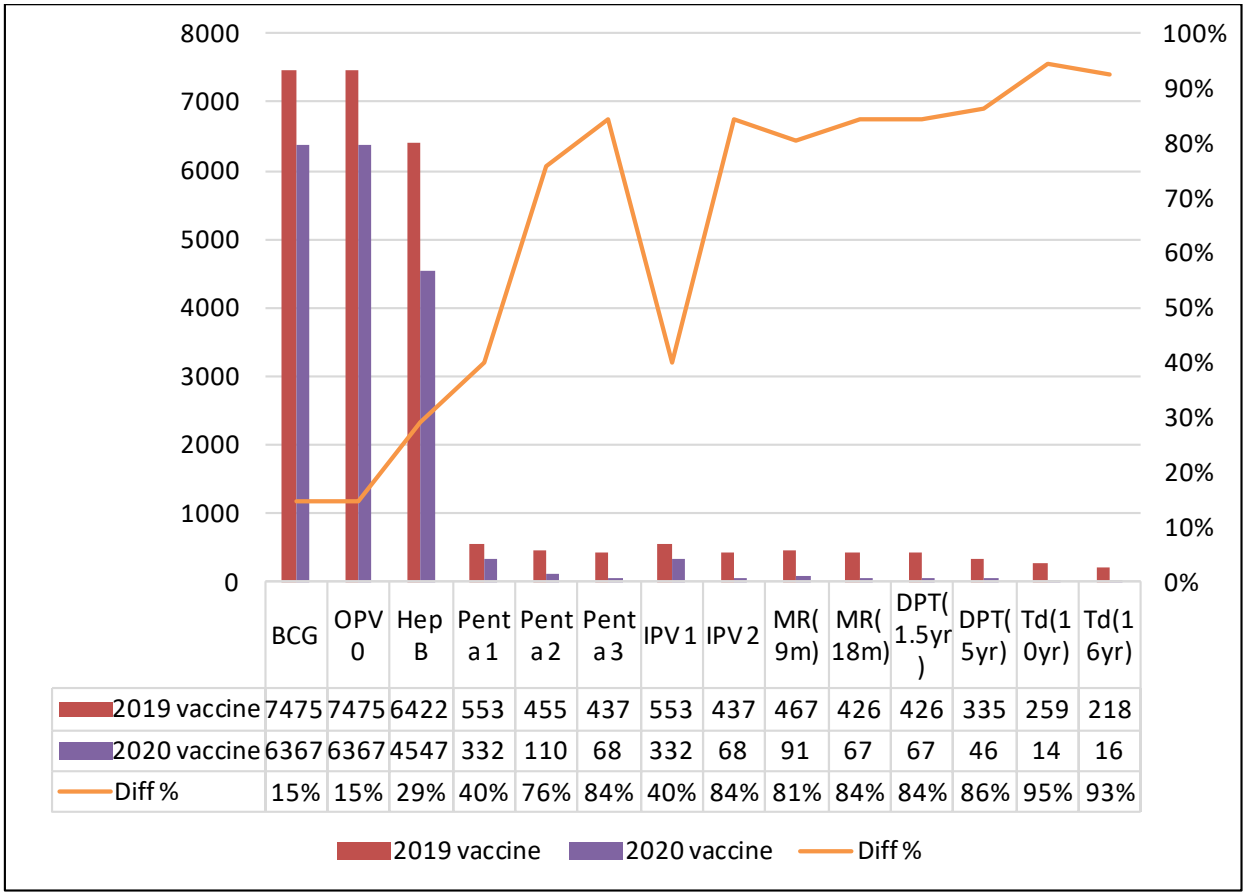
| Months | BCG | OPV0 | HepB | PENTA 1, OPV 1, IPV 1 | PENT A 2, OPV 2 | PENT A 3, OPV3 , IPV 2 | MR 9m | MR 18m | DPT 1.5yr | DPT 5yr | Td 10yr | Td 16yr |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Jan | +11% | +11% | -16% | -18% | -69% | -84% | -72% | -82% | -82% | -84% | -96% | -92% |
| Feb | +14% | +14% | +14% | -28% | -68% | -76% | -74% | -73% | -73% | -76% | -94% | -90% |
| Mar | +21% | +21% | -11% | -33% | -64% | -80% | -89% | -89% | -89% | -80% | -94% | -93% |
| Apr | +27% | +27% | -3% | -78% | -77% | -83% | -100% | -97% | -97% | -83% | -100% | -100% |
| May | -41% | -41% | -52% | -87% | -93% | -93% | -100% | -100% | -100% | -93% | -100% | -100% |
| Jun | -31% | -31% | -46% | -2% | -84% | -88% | -93% | -92% | -92% | -88% | -100% | -100% |
| Jul | -36% | -36% | -50% | -42% | -79% | -81% | -93% | -88% | -88% | -81% | -96% | -95% |
| Aug | -35% | -35% | -44% | -53% | -93% | -87% | -91% | -83% | -83% | -87% | -94% | -94% |
| Sep | -23% | -23% | -43% | -20% | -86% | -95% | -68% | -81% | -81% | -95% | -100% | -95% |
| Oct | -21% | -21% | -43% | -47% | -68% | -97% | -61% | -97% | -97% | -97% | -89% | -93% |
| Nov | -11% | -11% | -15% | -62% | -65% | -67% | -48% | -50% | -50% | -67% | -67% | -33% |
| Dec | -24% | -24% | -13% | -31% | -33% | -33% | -27% | -0% | -0% | -33% | +50% | +200 % |

As, shown in figure No-1, we compared total number of each vaccine in 2019 vs in 2020.

Number of immunised children were lower in 2020 as compared to 2019. Percentage of reduction in BCG, OPV was 15%, in Hep B 29%, in Pentavalent 1, IPV 1, OPV 1 were 40%. In Pentavalent 2, OPV 2 were 76%. In Pentavalent 3, OPV 3, IPV 2 were 84%. In MR 1 (9 month) 81% and in MR 2 (18 month) were 84%. In DPT 1st booster 84 % and in DPT 2nd booster was 86%. In Td 10 year & Td 16 year were 93%. Inj Td of 10 year was most affected and $OPV_0$ & BCG were least affected.

Mann Whitney test was calculated and U value is 79. As critical value of U at $p<0.05$ is 87 therefore, the result of difference in number of vaccinated children among 2019 & 2020 was significant at $p<0.05$.

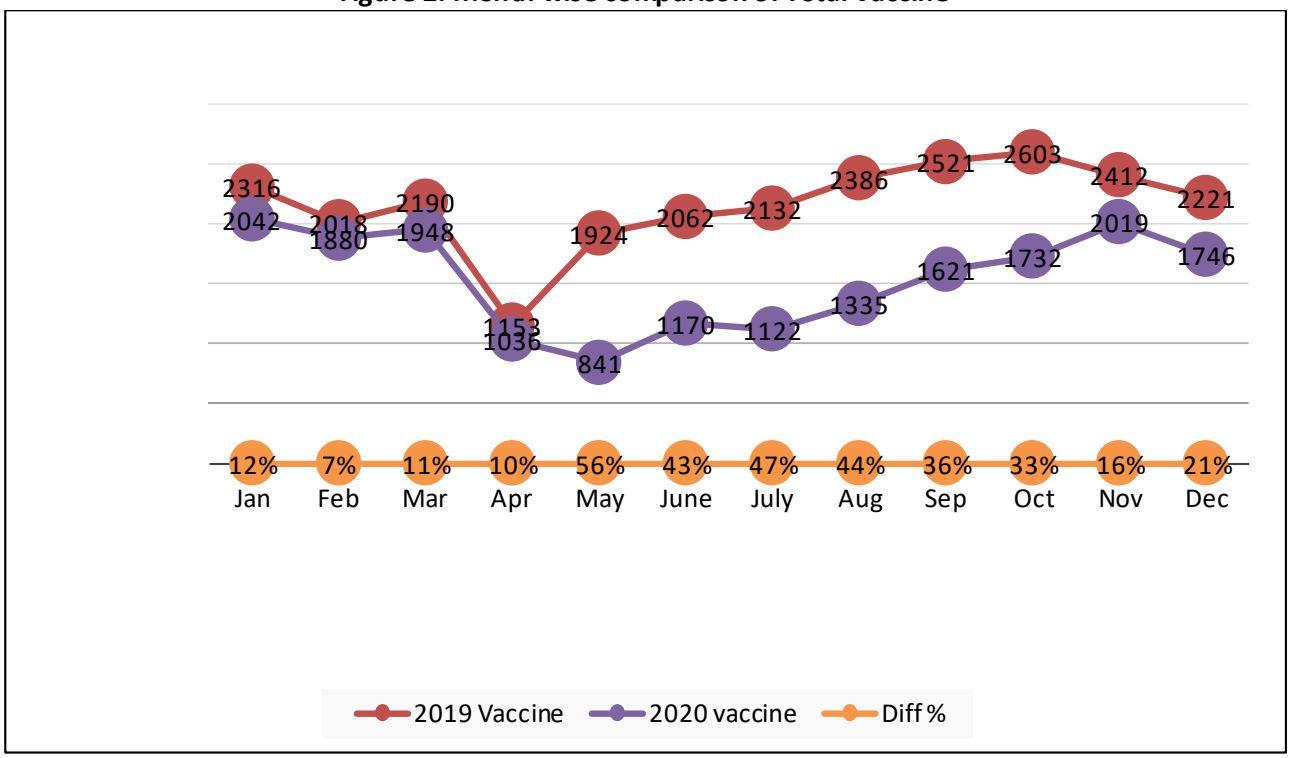
**Figure 1: Comparision of vaccine**




| | BCG | OPV 0 | Hep B | Penta 1 | Penta 2 | Penta 3 | IPV 1 | IPV 2 | MR( 9m) | MR( 18m) | DPT( 1.5yr ) | DPT( 5yr) | Td(10yr) | Td(16yr) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2019 vaccine | 7475 | 7475 | 6422 | 553 | 455 | 437 | 553 | 437 | 467 | 426 | 426 | 335 | 259 | 218 |
| 2020 vaccine | 6367 | 6367 | 4547 | 332 | 110 | 68 | 332 | 68 | 91 | 67 | 67 | 46 | 14 | 16 |
| Diff % | 15% | 15% | 29% | 40% | 76% | 84% | 40% | 84% | 81% | 84% | 84% | 86% | 95% | 93% |

Fig No- 2 suggests monthly comparison of total vaccine in 2019 and 2020 with reduction in percentage. In January of both year total reduction was 12%, in Feb 7%, in March 11%, in April 10%, in May 56%, in June 43%, in July 47%, in August 44%, in September 36%, in October 33%, in November 16%, in December 21%. Maximum reduction in percentage was seen in May month and least in February.

**Figure 2: Month wise comparison of Total Vaccine**



**Discussion:** The national immunization program run by the government of India is one of the largest in the world, with an annual reach of over 26 million children and 29 million pregnant women[12]. Mission Indradhanush was launched in 2014 to further extend this reach and achieve full immunization for 90% of children. While remarkable progress has been made, there is also evidence of existing inequalities in coverage[13,14].

As we all know, covid 19 was spread from Whuhan china to all over world and In India, first case was detected on 27 Jan 2020 in Kerala. Later on it involved the entire nation. Due to this pandemic, there was a lot of effect on socio economic development of the world as well as on physical and mental health of community and health system. Maximum health resources were utilised for prevention, surveillance and management of covid 19.

The National Health Mission's health management and information system reported a substantial decrease in routine immunization services relative to the previous year, indicating that in March 2020, at least 100,000 and 200,000 children missed their BCG and pentavalent diphtheria, tetanus, pertussis, hepatitis B and Hemophilus influenzae type b vaccines respectively[15].

Decline in routine vaccination during covid pandemic is supported by study done in US by santoli JM et al.[16].

Apart from shifting health resources for covid, People also developed fear of contracting covid infection from visiting health centre. Parents coming from peripheries have difficulties for public transportation due to lockdown. Difficulties in transportation and supply of vaccines from manufacturing to vaccination centre due to transportation problem. There was lack of guidelines for routine immunisation during pandemic till May 2020. This all lead to decrease in routine immunisation. So, this study was done to identify impact of covid on routine immunisation.

As shown in table no 1 there is increment in BCG and OPV from January- April 2019 to January-April 2020. Hospital deliveries in Jan-Apr 2019 were 2099 and in Jan-Apr 2020 were 2332. So, birth vaccines were given to a greater number of neonates in those months of 2020 as compare to 2019. And so that overall birth vaccines were least affected because child was already present in hospital. While all over Inj Td was maximum affected. Reason behind that may be parents have awareness of importance of vaccination up to 5 years and not aware about importance of vaccination in adolescents. So, in era of covid 19 parents couldn't understand importance of adolescents' vaccine and seeking of health facility.

When we compared data month wise, we observed that percentage of reduction in February was least affected and vaccination in May was maximum affected. Due to covid pandemic, whole nation lockdown was declared from 24 march then phase wise unlock was started from 1st June 2020[17]. In figure no-1, we can clearly see gradually decrement in difference between 2019 and 2020 line from June but it never reaches to initial level as even after unlock, parents have fear of covid and unaware about importance of vaccine. Many private vaccination centre were closed during lockdown so government vaccination should be more as compare to previous year but it was surprisingly decreased.

Even though this study was done in single centre, like this all over vaccination may be affected due to covid pandemic and due to this drop out there is chances of increase in vaccine preventable disease. So, large community base survey should be done to identify missed vaccine dose and catch-up vaccination plan should be decided otherwise what India has achieved in decremental trend in vaccine preventable disease may be affected.

Government of India has developed very efficient vaccination system for covid vaccine. As per data of MoHFW Ministry of health and family welfare of India, till 8th July 2021, number of people who has taken two doses of covid vaccine were 7,02,26,579. So, like that vaccination drive for routine vaccination also can be done so that already established chain and platform and can fill a gap of this decreased vaccination in whole country.

Many of the interventions should be done like cash subsidies, SMS reminders, chatbots, monitoring stock-outs, defaulter list generation, conducting outreach sessions through mobile vans, performance management of vaccinators,

can all be linked to a centralized electronic immunization registry EIR. Real-time data from EIRs can also facilitate governments in giving timely responses to changing trends through policy and guidelines[18].

**Conclusion:** Health system should design strategies for catch-up vaccination for the period of post COVID-19 outbreak and make plans which anticipate a gradual recovery to gap to prevent surge of vaccine preventable disease.

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